WHAT IS CLAIMED IS:

1. A method of making an array of corner cubes, the method comprising the steps of:

preparing a substrate, at least a surface portion of which is made of a cubic crystalline material and which has a surface that is substantially parallel to {111} planes of the crystalline material;

patterning the surface of the substrate such that a plurality of solid shape elements defines a predetermined pattern on the surface of the substrate, each of the solid shape elements being defined by a number of concave portions, a number of convex portions or a combination of concave and convex portions; and

supplying a first active species, including an element that is contained in the crystalline material, onto the substrate on which the solid shape elements have been formed.

2. The method of claim 1, wherein the step of supplying the first active species results in forming corner cube unit elements according to the predetermined pattern of the solid shape elements.

3. The method of claim 1, wherein the step of patterning the surface of the substrate includes the step of subjecting the surface of the substrate to an anisotropic etching

process.

4. The method of claim 3, wherein the anisotropic etching process includes a wet etching process.

5. The method of claim 3, wherein the step of patterning the surface of the substrate further includes the step of defining an etching mask layer on the surface of the substrate, before performing the step of subjecting the surface of the substrate to the anisotropic etching process, such that a size of the corner cube unit elements is controlled according to a pattern of the etching mask layer.

6. The method of claim 1, wherein the step of patterning the surface of the substrate includes the step of making the solid shape elements out of the crystalline material.

7. The method of claim 1, wherein the step of patterning the surface of the substrate includes the step of defining the solid shape elements by {100} planes of the crystalline material.

8. The method of claim 1, wherein the step of supplying the first active species includes the step of growing crystals anisotropically such that the growth rate thereof changes with

a crystallographic plane orientation.

9. The method of claim 8, wherein the step of growing the crystals includes the step of defining corner cube unit elements by {100} planes of the crystalline material.

10. The method of claim 8, wherein the step of preparing the substrate includes the step of preparing a substrate, at least the surface portion of which is made of gallium arsenide, and

wherein the step of growing the crystals includes the step of performing a vapor phase growth process using at least one of gallium or a compound including gallium and arsenic or a compound including arsenic as source material(s).

11. The method of claim 1, wherein the step of supplying the first active species includes the step of supplying a mixture of the first active species and a species, which contributes to etching the substrate, onto the substrate.

12. The method of claim 11, wherein the step of preparing the substrate includes the step of preparing a substrate, at least the surface portion of which is made of gallium arsenide, and

wherein the step of supplying the first active species

includes the step of performing a vapor phase etching process by supplying a halogen or a halogen compound and at least one of gallium or a compound including gallium and arsenic or a compound including arsenic onto the substrate.

13. The method of claim 1, wherein the step of supplying the first active species results in forming corner cube unit elements, each being defined by three {100} planes that are opposed substantially perpendicularly to each other.

14. The method of claim 13, wherein the three planes are three approximately square planes that are opposed substantially perpendicularly to each other.

15. The method of one of claim 1, further comprising the step of transferring the shape of the corner cube array, which has been formed on the surface of the substrate as a result of the step of supplying the first active species, onto another material.

16. A method of making an array of corner cubes, the method comprising the steps of:

preparing a substrate, at least a surface portion of which is made of a cubic crystalline material, which has a surface that is substantially parallel to {111} planes of the

crystalline material, and on which a plurality of solid shape elements have been formed so as to define a predetermined pattern thereon, each of the solid shape elements being defined by a number of concave portions, a number of convex portions or a combination of concave and convex portions;

supplying a first active species, including an element that is contained in the crystalline material, onto the substrate on which the solid shape elements have been formed, thereby growing crystals anisotropically such that the growth rate thereof changes with a crystallographic plane orientation; and

adjusting the shape of an exposed surface area of the substrate.

17. The method of claim 16, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the step of reducing unnecessary crystallographic planes, other than {100} planes of the crystalline material, in the exposed surface area of the substrate.

18. The method of claim 16, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the steps of:

performing a first patterning process on the substrate;

and

performing a second patterning process, which is a different type from the first patterning process, on the substrate,

wherein the step of performing the first patterning process results in reducing the unnecessary crystallographic planes in a first portion of the exposed surface area of the substrate but newly generating other unnecessary crystallographic planes in a second portion of the exposed surface area of the substrate, and

wherein the step of performing the second patterning process results in reducing the unnecessary crystallographic planes in the second portion but newly generating other unnecessary crystallographic planes in the first portion.

19. The method of claim 18, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the step of performing the first and second patterning processes alternately on the substrate until the corner cube array has a retro-reflectivity of at least 95% as a result of reduction of the unnecessary crystallographic planes.

20. The method of one of claim 16, wherein the step of adjusting the shape of the exposed surface area of the

substrate includes the step of removing portions of the exposed surface area of the substrate.

21. The method of one of claim 16, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the step of supplying a second active species, which includes an element that is contained in the crystalline material and which is either the same as, or different from, the first active species, onto the substrate, thereby further growing the crystals anisotropically.

22. The method of one of claim 16, wherein the step of performing the first patterning process includes the step of removing portions of the exposed surface area of the substrate, and

wherein the step of performing the second patterning process includes the step of supplying a second active species, which includes an element that is contained in the crystalline material and which is either the same as, or different from, the first active species, onto the substrate, thereby further growing the crystals anisotropically.

23. The method of claim 20, wherein the step of removing portions of the exposed surface area of the substrate includes the step of performing an anisotropic etching process.

24. The method of one of claim 16, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the step of supplying a mixture of a third active species, which includes an element that is contained in the crystalline material and which is either the same as, or different from, the first active species, and a species that contributes to etching the substrate.

25. The method of claim 24, wherein the step of supplying the mixture includes the step of etching the exposed surface area of the substrate anisotropically and growing the crystals thereon anisotropically at the same time.

26. The method of one of claim 16, wherein the step of adjusting the shape of the exposed surface area of the substrate includes the step of selectively etching, or growing crystals on, the exposed surface area of the substrate according to a crystallographic plane orientation of the crystalline material.

27. A corner cube array provided on a substrate, at least a surface portion of which is made of a cubic crystalline material, the corner cube array comprising:

a plurality of solid shape elements, which are arranged

in a predetermined pattern on the surface of the substrate, the surface being substantially parallel to {111} planes of the crystalline material, each of the solid shape elements being defined by a number of concave portions, a number of convex portions or a combination of concave and convex portions; and

a crystal layer, which is provided on the solid shape elements by growing crystals thereon anisotropically with an active species, including an element that is contained in the crystalline material, supplied such that the growth rate of the crystals changes with a crystallographic plane orientation.